MARINE FISHERIES INFORMATION SERVICE

Technical and Extension Series

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

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THE MARINE FISHERIES INFORMATION SERVICE: Technical and Extension Series envisages the rapid dissemination of information on marine and brackish water fishery resources and allied data available with the Fishery Data Centre and the Research Divisions of the Institute, results of proven researches for transfer of technology to the fish farmers and industry and of other relevant information needed for Research and Development efforts in the marine fisheries sector.

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CONTENTS

Cover photo: Tuna landings at Sakthikulangara

TRENDS IN TOTAL MARINE FISH PRODUCTION IN INDIA – 1979*

The total marine fish production in India during 1979 was estimated at 13,88,380 tonnes as against 14,03,607 tonnes recorded during 1978, showing a marginal decrease of about 15,000 tonnes (1.08%). While Orissa, Andhra Pradesh, Tamil Nadu, Pondicherry, Maharashtra, Andamans and Lakshadweep recorded comparatively higher landings, West Bengal (Contai coast), Kerala, Karnataka, Goa and Gujarat accounted lower landings. The statewise total marine fish landings in India during the years 1978 and 1979 are shown in Table-1.

Table 1. *Statewise total marine fish landings in India (in tonnes) during the years* 1978 *and* 1979

Sl. No.	State	1979	1978
1.	West Bengal	10,744	12,754
2.	Orissa	51,808	39,670
3.	Andhra Pradesh	91,426	82,116
4.	Tamil Nadu	2,35,008	2,12,899
5.	Pondicherry	10,068	6,828
6.	Kerala	3,30,509	3,73,339
7.	Karnataka	1,26,384	1,52,860
8.	Goa	25,388	27,111
9.	Maharashtra	2,93,326	2,84,244
10.	Gujarat	1,91,312	2,01,929
11.	Andamans	1,721	1,579
12.	Lakshadweep	3,846	2,780
13.	Private trawlers†	16,840	5,498
	TOTAL	13,88,380	14,03,607

†Partial coverage of larger trawlers.

Pelagic and demersal group of fishes

The specieswise composition of total marine fish landings in India is shown in Table 2. The pelagic group of species comprises of *Chirocentrus,* oil sardine, other sardines, *Hilsa ilisha,* other *Hilsa,* anchovies and white baits, other clupeids, *Harpodon nehereus, Hemirhamphus & Belone,* flying fish, ribbon fish, carangids, mackerel, seerfish, tunnies, *Sphyraena, Mugil* and *Bregmaceros.* The elasmobranchs, eels, catfishes, lizard fishes, perches, red mullets, polynemids, sciaenids, silver bellies, *Lactarius,* pomfrets, soles, prawns, lobsters and cephalopods form the demersal group. The statewise distribution of pelagic and demersal group of fishes is shown in Table 3 and Fig. 1.

Table 3. *Statewise distribution of pelagic and demersal group of fishes during* 1979 *(in tonnes)*

Sl. No.	State	Pelagic	Demersal	Total
1.	West Bengal	6,419	4,325	10,744
2.	Orissa	23,133	28,675	51,808
3.	Andhra Pradesh	42,049	49,377	91,426
4.	Tamil Nadu	1,12,923	1,22,085	2,35,008
5.	Pondicherry	5,795	4,273	10,068
6.	Kerala	2,28,272	1,02,237	3,30,509
7.	Karnataka	97,889	28,495	1,26,384
8.	Goa	15,830	9,558	25,388
9.	Maharashtra	1,07,224	1,86,102	2,93,326
10.	Gujarat	1,04,476	86,836	1,91,312
11.	Andamans	1,145	576	1,721
12.	Lakshadweep	3,198	648	3,846
13.	Private trawlers	—	16,840	16,840
	TOTAL	7,48,353	6,40,027	13,88,380

From Table 3, it is seen that Kerala accounted for the highest catch of pelagic fishes during 1979 followed by Tamilnadu, Maharashtra, Gujarat and Karnataka in the order of abundance. Maharashtra contributed the highest catch of demersal fishes, Tamil Nadu, Kerala and Gujarat being other major states that landed this group of fishes.

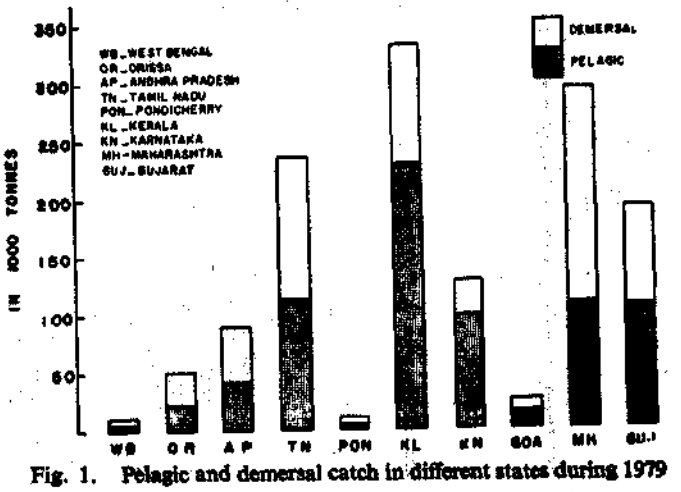


Fig. 1. Pelagic and demersal catch in different states during 1979

* Prepared by the Fishery Resources Assessment Division.

Table. 2. *Estimated marine fish landings in India during 1979 (Figures in tonnes)*

Sl. No.	Name of fish	West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondi-cherry	Kerala	Karnataka	Goa	Maha-rashtra	Gujarat	Andamans	Laksha-dweep	Private* trawlers	Total
1.	Elasmobranchs	244	4,331	6,994	12,393	222	6,954	2,531	1,280	12,516	4,926	88	364	—	52,843
2.	Eels	—	2	245	119	88	10	1	35	4,033	2,622	—	—	—	7,155
3.	Cat fishes	140	1,308	3,799	5,617	51	11,328	9,920	846	10,433	5,320	55	—	—	48,817
4.	*Chirocentrus*	407	1,644	976	1,839	167	1,125	258	122	1,721	1,970	45	—	—	10,274
5. a.	Oil sardine	—	—	—	1,011	—	1,16,834	33,080	3,030	16	—	—	—	—	1,53,971
b.	Lesser sardines	—	2,687	6,180	33,289	1,998	15,914	4,753	2,471	927	—	132	—	—	68,351
c.	Hilsa *ilisha*	660	9,969	78	41	—	6	10	2	1,071	231	—	—	—	12,068
d.	Other *Hilsa*	38	359	1,092	2,761	12	36	52	14	429	3,837	42	—	—	8,672
e.	*Anchoviella*	14	505	5,888	11,061	346	6,552	1,721	—	382	—	119	—	—	26,588
f.	*Thrissocles*	270	295	3,433	5,542	429	1,789	441	911	2,832	686	—	—	—	16,628
g.	Other clupeids	1,517	1,431	2,518	3,564	345	674	2,278	378	15,675	5,552	33	—	—	33,965
6. a.	*Harpodon nehereus*	1,211	449	717	1	—	1	5	9	59,667	63,984	—	—	—	1,26,044
b.	*Saurida & Saurus*	—	50	1,379	1,498	262	5,326	155	104	2,374	6	—	—	—	11,154
7.	*Hemirhamphus & Belone*	—	28	100	624	6	257	49	13	126	185	88	101	—	1,577
8.	Flying fish	—	4	71	1,599	854	—	—	1	1	—	—	16	—	2,546
9.	Perches	225	151	3,095	5,919	1,004	20,239	181	203	3,225	973	239	203	—	35,657
10.	Red mullets	—	2	426	1,448	203	127	30	—	859	8	—	27	—	3,130
11.	Polynemids	172	1,491	1,412	353	14	29	2	—	1,600	736	—	—	—	5,809
12.	Sciaenids	915	5,351	8,825	18,948	306	5,237	2,348	1,492	21,366	28,230	—	—	—	93,018
13.	Ribbon fish	291	616	6,337	21,040	129	25,718	1,193	548	10,983	4,491	3	—	—	71,349
14. a.	*Carnax*	71	326	3,185	7,022	537	12,339	1,103	1,343	2,314	510	134	58	—	28,942
b.	*Chorinemus*	67	716	444	844	27	128	59	140	416	466	—	—	—	3,307
c.	*Trachynotus*	—	—	—	182	—	—	13	—	—	—	—	—	—	195
d.	Other carangids	—	—	56	23	—	—	1	—	385	—	—	—	—	465
e.	*Coryphaena*	—	1	7	37	2	48	—	—	51	—	—	—	—	146
f.	*Elacate*	—	1	—	535	—	120	34	190	—	—	—	—	—	880
15. a.	*Leiognathus*	96	1,108	3,585	42,886	746	3,597	1,565	881	724	—	78	—	—	55,266
b.	*Gazza*	—	—	—	197	—	—	—	—	—	—	—	—	—	197
16.	*Lactarius*	—	5	945	1,323	11	253	433	291	430	783	—	—	—	4,474
17.	Pomfrets	923	10,109	2,069	877	35	1,737	250	138	14,941	9,319	29	—	—	40,427
18.	Mackerel	—	306	2,621	3,521	424	18,585	40,084	4,391	1,455	35	92	—	—	71,514
19.	Seer fish	331	2,444	5,547	5,228	105	6,275	1,645	1,101	4,027	2,682	138	24	—	29,547
20.	Tunnies	—	31	437	3,211	1	15,391	1,717	742	1,772	442	57	2,794	—	26,595
21.	*Sphyraena*	—	5	62	1,463	22	477	41	7	82	—	95	11	—	2,265
22.	*Mugil*	—	22	159	229	27	39	—	14	38	751	121	—	—	1,400
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	276	362	—	—	—	638
24.	Soles	—	125	610	2,337	162	4,487	874	893	2,304	411	—	—	—	12,203
25. a.	Penaeid prawns	410	2,983	8,697	10,222	532	29,522	4,654	1,594	45,638	8,606	64	—	743	1,13,665
b.	Non-penaeid prawns	161	34	3,117	897	72	75	6	—	56,208	3,347	—	—	—	63,917
c.	Lobsters	—	—	33	340	5	26	15	6	499	211	—	—	—	1,135
d.	Crabs & other crustaceans	—	6	1,109	5,883	242	7,643	2,740	1,379	519	783	—	—	—	20,304
26.	Cephalopods	—	14	523	1,903	50	2,976	68	173	3,959	5,351	—	15	—	15,032
27.	Miscellaneous	2,581	2,899	4,655	17,181	632	8,635	12,074	646	7,052	33,496	69	233	16,097	1,06,250
	TOTAL	10,744	51,808	91,426	2,35,008	10,068	3,30,509	1,26,384	25,388	2,93,326	1,91,312	1,721	3,846	16,840	13,88,380

*Partial coverage of larger trawlers.

Table 4. *Composition of marine fish landings in India during* 1969 *to* 1979 *(In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	35,442	44,048	41,348	46,237	44,917	66,054	65,230	54,605	62,216	61,621	52,843
2.		Eels	3,052	6,983	4,056	4,509	3,869	4,011	51,710	8,296	12,997	8,781	7,155
3.		Catfishes	26,903	50,631	48,858	42,443	52,642	76,196	68,689	43,540	53,504	39,231	48,817
4.		*Chirocentrus*	9,337	9,158	9,366	9,532	11,090	9,026	11,813	10,368	11,909	10,990	10,274
5.	a.	Oil sardine	1,74,249	2,26,997	2,09,261	1,27,568	1,44,395	1,26,676	1,59,240	1,69,262	1,50,130	1,68,078	1,53,971
	b.	Lesser sardines	52,467	55,220	61,283	44,629	1,08,523	83,921	1,12,117	1,00,000	65,724	52,838	68,351
	c.	*Hilsa ilisha*	661	1,050	1,769	1,409	404	4,248	8,897	7,842	4,189	9,894	12,068
	d.	Other *Hilsa*	7,873	9,492	10,361	12,229	11,918	7,541	7,567	8,482	14,651	12,800	8,672
	e.	*Anchoviella*	31,436	24,400	19,516	18,699	25,394	41,507	30,744	30,069	34,033	39,054	26,588
	f.	*Thrissocles*	9,009	14,087	10,801	11,130	13,194	11,433	9,997	17,660	9,929	14,304	16,628
	g.	Other clupeids	26,316	26,439	24,100	28,490	35,350	43,226	52,786	57,164	41,458	37,020	33,965
6.	a.	*Harpodon nehereus*	76,276	78,443	71,508	51,570	64,345	61,138	99,614	87,075	85,236	1,25,481	1,26,044
	b.	*Saurida & Saurus*	3,043	2,813	3,687	4,748	4,049	12,520	14,323	5,292	8,525	10,808	11,154
7.		*Hemirhamphus & Belone*	981	1,814	1,018	687	1,110	4,574	1,980	1,169	2,311	1,478	1,577
8.		Flying fish	4,039	2,844	9,179	1,415	6,388	1,012	1,832	1,439	643	1,681	2,546
9.		Perches	12,865	13,913	12,993	15,247	21,513	36,837	35,232	18,162	31,799	49,312	35,657
10.		Red mullets	3,475	2,118	3,881	6,004	3,925	7,009	2,641	5,216	2,422	2,984	3,130
11.		Polynemids	3,480	7,168	7,252	7,100	9,248	10,637	14,044	14,573	3,929	5,469	5,809
12.		Sciaenids	35,041	41,903	36,903	40,159	87,682	79,261	1,14,535	87,581	99,887	96,379	93,018
13.		Ribbon fish	31,722	26,984	44,690	36,225	53,106	63,029	57,330	64,542	42,407	77,785	71,349
14.	a.	*Caranx*	21,415	18,412	20,592	27,009	25,298	19,316	23,005	25,745	30,666	16,956	28,942
	b.	*Chorinemus*	2,443	2,120	2,109	2,952	2,827	3,797	3,380	3,322	4,119	3,359	3,307
	c.	*Trachynotus*	149	143	17	2	189	122	64	35	80	106	195
	d.	Other carangids	7	966	304	308	129	91	207	1,572	219	423	465
	e.	*Coryphaena*	237	254	59	222	228	286	411	261	226	64	146
	f.	*Elacate*	309	518	347	403	529	229	221	383	429	568	880
15.	a.	*Leiognathus*	44,038	49,275	32,510	32,314	48,127	50,902	39,813	42,445	34,504	41,777	55,266
	b.	*Gazza*	102	154	156	78	41	338	424	966	61	104	197
16.		*Lactarius*	4,546	4,697	5,313	7,579	13,912	8,913	11,848	12,045	10,961	7,906	4,474
17.		Pomfrets	24,176	17,589	21,000	19,007	22,052	22,421	24,987	37,701	35,127	41,434	40,427
18.		Mackerel	91,837	1,39,206	2,04,575	1,08,971	79,423	37,462	45,947	65,497	62,136	85,233	71,514
19.		Seer fish	11,516	13,410	18,339	21,210	19,700	19,841	18,897	20,159	21,119	20,779	29,547
20.		Tunnies	3,445	3,015	6,032	5,760	5,678	10,839	11,285	19,322	13,005	13,893	26,595
21.		*Sphyraena*	1,996	1,530	1,271	2,367	3,415	4,862	2,150	2,388	2,423	3,709	2,265
22.		*Mugil*	2,693	2,428	3,737	1,559	3,138	4,497	3,515	2,613	2,269	2,626	1,400
23.		*Bregmaceros*	1,684	2,196	4,345	5,488	4,213	1,872	1,043	380	30	184	638
24.		Soles	11,991	13,364	11,380	9,718	14,642	18,917	12,044	10,088	10,810	13,620	12,203
25.	a.	Peneaid prawns	72,133	89,857	72,109	78,361	1,36,514	1,14,934	1,41,713	1,14,640	96,472	1,29,204	1,13,665
	b.	Non-penaeid prawns	33,964	31,834	76,734	85,488	66,955	55,244	79,038	76,787	73,992	50,652	63,917
	c.	Lobsters	—	—	—	—	—	—	2,991	2,532	1,217	1,307	1,135
	d.	Crabs & other crustaceans	5,670	10,832	9,612	11,599	12,508	16,663	19,893	19,999	20,068	14,202	20,304
26.		Cephalopods	769	1,184	1,505	1,026	1,394	3,677	7,889	10,826	10,005	15,931	15,032
27.		Miscellaneous	30,843	36,118	37,513	48,598	56,266	72,718	97,607	90,812	91,945	1,13,582	1,06,250
		TOTAL	9,13,630	10,85,607	11,61,389	9,80,049	12,20,240	12,17,797	14,22,693	13,52,855	12,59,782	14,03,607	13,88,380

Table 5. *Composition of marine fish landings in West Bengal during 1976 to 1979 (In tonnes)*

Sl.No.		Name of fish	1976	1977	1978	1979
1.		Elasmobranchs	493	73	125	244
2.		Eels	1	1	—	—
3.		Catfishes	785	134	151	140
4.		*Chirocentrus*	251	107	217	407
5.	a.	Oil sardine	—	—	—	—
	b.	Lesser sardines	12	—	4	—
	c.	*Hilsa ilisha*	799	96	193	660
	d.	*Other Hilsa*	—	—	28	38
	e.	*Anchoviella*	6	4	24	14
	f.	*Thrissocles*	1,397	365	774	270
	g.	Other clupeids	1,790	705	1,174	1,517
6.	a.	*Harpodon nehereus*	2,253	1,060	1,365	1,211
	b.	*Saurida & Saurus*	—	—	—	—
7.		*Hemirhamphus & Belone*	—	—	11	—
8.		Flying fish	—	—	—	—
9.		Perches	1	—	—	225
10.		Red mullets	—	—	—	—
11.		Polynemids	69	25	87	172
12.		Sciaenids	4,066	819	1,772	915
13.		Ribbon fish	701	306	681	291
14.	a.	*Caranx*	—	—	2	71
	b.	*Chorinemus*	37	12	38	67
	c.	*Trachynotus*	—	—	—	—
	d.	Other carangids	—	—	—	—
	e.	*Coryphaena*	—	—	—	—
	f.	*Elacate*	—	—	—	—
15.	a.	*Leiognathus*	219	15	297	96
	b.	*Gazza*	—	—	—	—
16.		*Lactarius*	—	1	—	—
17.		Pomfrets	586	143	282	923
18.		Mackerel	—	—	—	—
19.		Seer fish	287	32	54	331
20.		Tunnies	—	—	—	—
21.		*Sphyraena*	—	—	—	—
22.		*Mugil*	2	—	—	—
23.		*Bregmaceros*	—	—	—	—
24.		Soles	—	—	24	—
25.	a.	Penaeid prawns	2,139	602	605	410
	b.	Non-penaeid prawns	2,708	269	663	161
	c.	Other crustaceans	—	—	—	—
26.		Cephalopods	—	—	30	—
27.		Miscellaneous	6,809	1,920	4,153	2,581
		TOTAL	25,411	6,689	12,754	10,744

All India marine fish production during 1969 to 1979

Table 4 shows the all India total marine fish production and its species composition for the 11 year period 1969 to 1979. The production figures show a steady increase from 1969 to 1971 and a fluctuating trend thereafter. The maximum and minimum landings were recorded during 1975 and 1969 respectively. The landings during 1979 formed about 98% of the maximum recorded in 1975. The trends in marine fish production in respect of various maritime states of India are shown in Tables 5 to 17.

Statewise production

West Bengal

A decline of about 2,000 t in the total landings as compared to 1978 was noticed during 1979 (Table 1). This was mainly due to fall in the landings of sciaenids, prawns, *Thrissocles* and ribbon fish by about 860, 700, 500

and 390 t respectively. The catch of pomfrets, *Hilsa ilisha*, other clupeids and seer fish, however, showed an increase of about 640, 470, 340 and 280 t respectively. Table 5 shows the species composition of marine fish landings in West Bengal during the period 1976 to 1979. Prior to 1976, separate estimates for West Bengal alone were not available as the estimates for West Bengal and Orissa were combined and the same for the years 1969 to 1975 are shown in Table 6.

Orissa

The increasing trend in the total catch as noticed in 1978 continued this year also, the increase during the year 1979 being about 12,000 t. Higher landings of pomfrets, *Hilsa ilisha*, seer fish and elasmobranchs were recorded, the increase being 4,400, 2,200, 1,400 and 950 t respectively. Marginal decline in the catch of *Anchoviella*, other *Hilsa* and catfishes was also noticed during the year 1979. Table 7 shows the species composition of marine fish landings in Orissa during the period 1976 to 1979.

Andhra Pradesh

A notable feature observed during 1979 was the increase in the total landings after a steady decline from 1974 to 1978 (Table 8). The increase in 1979 was about 9,300 t as compared to 1978. The species that contributed to this increase were sciaenids (3,200 t), seer fish (2,900 t), prawns (2,300 t), *Thrissocles* (1,600 t) and *Leiognathus* (1,400 t). However, the landings of *Anchoviella*, elasmobranchs and lesser sardines showed a decline. The specieswise composition of marine

Table 6. *Composition of marine fish landings in West Bengal & Orissa during 1969 to 1975 (in tonnes)*

Sl. No.	Name of fish	1969	1970	1971	1972	1973	1974	1975
1.	Elasmobranchs	492	1,167	325	829	833	1,672	1,450
2.	Eels	—	—	8	24	43	84	4
3.	Catfishes	191	446	315	525	534	1,232	3,383
4.	*Chirocentrus*	1,025	1,163	464	334	737	565	687
5. a.	Oil sardine	247	—	2	—	38	4	—
b.	Lesser sardines	3,905	3,058	2,044	1,442	2.035	1,740	957
c.	*Hilsa ilisha*	47	289	104	37	162	3,513	5,254
d.	Other *Hilsa*	22	—	77	7	203	207	181
e.	*Anchoviella*	900	510	316	673	768	362	207
f.	*Thrissocles*	234	806	222	374	160	785	1,608
g.	Other clupeids	2,737	7,112	1,342	819	3,408	2,122	3,436
6. a.	*Harpodon nehereus*	1,348	818	1,031	924	1,984	1,326	3,043
b.	*Saurida & Saurus*	26	89	10	9	3	5	6
7.	*Hemirhamphus & Belone*	5	6	3	4	1	—	5
8.	Flying fish	—	—	—	—	—	—	—
9.	Perches	4	30	121	50	104	38	201
10.	Red mullets	34	—	5	10	4	20	14
11.	Polynemids	50	258	88	88	136	313	224
12.	Sciaenids	1,274	2,617	2,727	2,479	1,323	1,671	4,474
13.	Ribbon fish	581	1,470	825	530	902	550	1,252
14. a.	*Caranx*	372	844	91	79	132	27	237
b.	*Chorinemus*	100	91	70	74	172	212	165
c.	*Trachynotus*	—	—	—	—	—	—	—
d.	Other carangids	—	—	—	—	—	1	2
e.	*Coryphaena*	—	—	—	—	—	—	—
f.	*Elacate*	—	—	—	—	—	16	1
15. a.	*Leiognathus*	937	891	317	921	438	399	552
b.	*Gazza*	—	—	4	—	—	—	—
16.	*Lactarius*	5	58	8	29	7	24	6
17.	Pomfrets	423	426	643	634	728	1,110	2,501
18.	Mackerel	28	1,764	398	102	80	211	116
19.	Seer fish	612	826	338	329	769	1,169	554
20.	Tunnies	—	1	42	28	46	9	16
21.	*Sphyraena*	—	6	9	6	1	5	3
22.	*Mugil*	13	37	23	68	18	40	44
23.	*Bregmaceros*	—	—	—	—	—	—	—
24.	Soles	45	57	8	41	24	100	30
25. a.	Penaeid prawns	5,638	2,994	1,414	1,471	2,565	2,322	2,920
b.	Non-penaeid prawns	—	22	86	—	486	1,165	2,787
c.	Other crustaceans	—	3	1	3	60	45	8
26.	Cephalopods	2	3	89	7	7	—	2
27.	Miscellaneous	1,582	3,541	4,462	2,380	3,825	3,028	9,431
	TOTAL	**22,879**	**31,403**	**18,032**	**15,330**	**22,736**	**26,092**	**45,761**

Table 7. *Composition of Marine fish landings in Orissa during 1976 to 1979 (in tonnes)*

Sl. No.		Name of fish	1976	1977	1978	1979
1.		Elasmobranchs	2,974	1,658	3,386	4,331
2.		Eels	1	—	3	2
3.		Catfishes	1,988	1,035	1,794	1,308
4.		*Chirocentrus*	517	752	1,073	1.644
5.	a.	Oil sardine	—	—	—	—
	b.	Lesser sardines	1,657	1,227	2,514	2,687
	c.	*Hilsa ilisha*	5,477	2,948	7,737	9,969
	d.	Other *Hilsa*	129	492	848	359
	e.	*Anchoviella*	339	486	1,169	505
	f.	*Thrissocles*	106	197	175	295
	g.	Other clupeids	772	778	1,330	1,431
6.	a.	*Harpodon nehereus*	87	86	314	449
	b.	*Saurida & Saurus*	1	5	5	50
7.		*Hemirhamphus & Belone*	1	—	13	28
8.		Flying fish	—	—	4	4
9.		Perches	31	55	173	151
10.		Red mullets	1	1	2	2
11.		Polynemids	244	406	1,287	1,491
12.		Sciaenids	333	312	5,198	5,351
13.		Ribbon fish	130	174	336	616
14.	a.	*Caranx*	147	103	68	326
	b.	*Chorinemus*	237	386	815	716
	c.	*Trachynotus*	—	—	—	—
	d.	Other carangids	—	—	—	—
	e.	*Coryphaena*	2	1	—	1
	f.	*Elacate*	—	9	3	1
15.	a.	*Leiognathus*	378	233	256	1,108
	b.	*Gazza*	1	—	—	—
16.		*Lactarius*	1	18	12	5
17.		Pomfrets	10,699	1,018	5,714	10,109
18.		Mackerel	425	195	196	306
19.		Seer fish	940	672	1,059	2,444
20.		Tunnies	84	37	609	31
21.		*Sphyraena*	1	3	4	5
22.		*Mugil*	5	—	3	22
23.		*Bregmaceros*	—	—	—	—
24.		Soles	6	72	103	125
25.	a.	Penaeid prawns	688	802	2,599	2,983
	b.	Non-penaeid prawns	100	17	12	34
	c.	Other crustaceans	23	6	4	6
26.		Cephalopods	27	—	4	14
27.		Miscellaneous	1,271	888	848	2,899
		TOTAL	29,823	15,072	39,670	51,808

fish landings in Andhra Pradesh for the years 1969 to 1979 are shown in Table 8.

Tamil Nadu

During 1979, a total catch of about 2.35 lakh t was observed, this being the highest so far recorded (Table 9), the increase in the total catch during the year being about 22,000 t as compared to 1978. This was mainly due to increase in the landings of silver bellies (12,700 t), other sardines (12,200 t), sciaenids (4,700 t), *Caranx* (3,900 t), *Anchoviella* (3,600 t), mackerel (2,100 t) and tunnies (2,000 t). The landings of ribbon fish during 1979 showed a decrease of about 7,600 t and the catch of penaeid prawns declined by about 3,100 t. Other crustaceans, perches and elasmobranchs also recorded poor landings. Table 9 shows the species composition of marine fish landings in Tamil Nadu during 1969 to 1979.

Pondicherry

The total landings during 1979 increased by about 3,200 t as compared to 1978. This was brought about by the increase in the catches of lesser sardines (800 t), perches (500 t), *Caranx* (300 t), penaeid prawns (300 t) and mackerel (250 t). Some decline in the landings of *Anchoviella* and cat fishes was also noticed. The species composition of marine fish production in Pondicherry for the years 1969 to 1979 is shown in Table 10.

Kerala

A decline of about 43,000 t in the total catch was observed during 1979 as compared to 1978. The

Table 8. *Composition of marine fish landings in Andhra Pradesh during* 1969 *to* 1979 *(In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	3,969	4,038	4,530	7,400	8,354	11,394	9,977	6,688	6,450	8,704	6,994
2.		Eels	93	387	107	110	270	451	1,837	205	438	1,082	245
3.		Catfishes	3,088	2,346	2,724	3,651	10,780	15,890	9,824	6,131	5,662	3,281	3,799
4.		*Chirocentrus*	1,460	1,462	1,439	2,248	2,635	2,281	2,920	1,837	1,217	1,262	976
5.	a.	Oil sardine	—	—	—	—	125	564	131	112	—	—	—
	b.	Lesser sardines	13,371	19,097	19,949	7,587	11,928	31,520	32,994	23,220	10,972	7,685	6,180
	c.	*Hilsa ilisha*	2	67	796	220	45	—	70	280	41	2	78
	d.	Other *Hilsa*	1,084	892	769	3,087	2,783	2,347	930	1,815	1,654	1,349	1,092
	e.	*Anchoviella*	5,399	5,035	1,332	2,005	4,865	9,869	7,037	11,309	8,947	7,810	5,888
	f.	*Thrissocles*	2,791	1,310	953	1,111	2,486	1,895	1,776	1,763	1,398	1,824	3,433
	g.	Other clupeids	4,585	2,685	6,004	8,892	9,184	10,195	7,536	8,410	2,363	1,794	2,518
6.	a.	*Harpodon nehereus*	152	220	778	297	221	125	359	214	960	1,099	717
	b.	*Saurida & Saurus*	445	93	112	504	386	267	242	166	875	1,057	1,379
7.		*Hemirhamphus & Belone*	33	323	208	17	3	194	24	14	135	60	100
8.		Flying fish	29	464	247	52	105	2	1	—	84	65	71
9.		Perches	538	643	1,466	1,485	1,470	2,213	4,888	1,751	2,727	1,945	3,095
10.		Red mullets	193	238	372	447	220	305	721	553	315	335	426
11.		Polynemids	920	615	1,570	2,185	1,393	2,231	1,836	1,813	698	1,075	1,412
12.		Sciaenids	6,874	4,091	5,954	7,277	7,576	12,358	11,682	10,891	10,182	5,597	8,825
13.		Ribbon fish	9,970	6,473	7,432	3,585	3,761	11,834	11,701	12,443	8,546	5,505	6,337
14.	a.	*Caranx*	1,958	2,529	2,484	2,425	2,589	2,901	3.498	3.047	4,003	2,000	3,185
	b.	*Chorinemus*	262	202	533	552	1,056	1,620	1,790	1,820	530	665	444
	c.	*Trachynotus*	—	—	—	—	—	—	6	1	—	—	—
	d.	Other carangids	—	36	15	—	—	—	6	5	78	87	56
	e.	*Coryphaena*	8	74	17	106	36	101	251	89	137	24	7
	f.	*Elacate*	30	21	2	38	56	2	25	14	7	53	—
15.	a.	*Leiognathus*	2,428	2,541	2,247	2,971	2,806	4,830	11,268	3,876	5,903	2,174	3,585
	b.	*Gazza*	—	6	—	1	3	12	101	48	—	—	—
16.		*Lactarius*	1,306	975	841	1,396	982	1,914	2,513	1,718	1,132	684	945
17.		Pomfrets	2,205	2,017	3,591	4,165	4,087	3,945	5,697	4,088	2,529	2,445	2,069
18.		Mackerel	1,588	2,090	1,402	5,396	2,519	1,734	1,593	2,084	1,040	2,520	2,621
19.		Seer fish	2,951	3,608	3,352	5,830	4,054	4,438	5,277	3,412	3,261	2,600	5,547
20.		Tunnies	193	135	293	495	141	683	664	334	449	328	437
21.		*Sphyraena*	150	8	70	88	18	19	119	187	108	43	62
22.		*Mugil*	288	141	543	118	255	1,848	954	892	170	237	159
23.		*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.		Soles	103	91	79	215	187	220	305	56	680	347	610
25.	a.	Penaeid prawns	4,307	5,004	8,917	5,145	8,170	9,857	7,152	8,833	6,266	8,031	8,697
	b.	Non-penaeid prawns	1,757	1,886	288	437	669	2,842	3,523	2,275	5,109	1,532	3,117
	c.	Lobsters	—	—	—	—	—	—	102	3	2	20	33
	d.	Crabs & other crustaceans	114	97	95	279	364	934	605	329	719	477	1,109
26.		Cephalopods	70	663	114	67	61	165	151	242	408	297	523
27.		Miscellaneous	2,812	1,856	2,385	2,596	2,901	4,818	3,552	8,353	4,561	6,021	4,655
		TOTAL	77,526	74,459	84,010	84,480	99,544	1,58,818	1,55,638	1,31,321	1,00,756	82,116	91,426

Table 9. *Composition of marine fish landings in Tamil Nadu during* 1969 *to* 1979 *(In tonnes)*

Sl. No.	Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.	Elasmobranchs	13,030	18,974	16,913	12,960	12,844	23,025	20,614	19,039	18,327	15,121	12,393
2.	Eels	263	219	147	47	121	296	110	620	232	325	119
3.	Catfishes	4,026	7,158	7,219	5,353	9,861	10,322	7,469	5,033	15,205	5,252	5,617
4.	*Chirocentrus*	3,950	3,618	2,952	2,320	3,178	1,625	1,811	2,058	2,475	1,736	1,839
5. a.	Oil sardine	18	46	45	146	45	—	—	—	714	36	1,011
b.	Lesser sardines	17,581	16,963	23,562	21,051	26,059	15,430	35,610	25,169	26,259	21,050	33,289
c.	*Hilsa ilisha*	116	15	191	170	10	14	121	22	343	161	41
d.	Other *Hilsa*	2,569	2,336	2,804	2,088	1,349	681	1,158	2,331	5,784	4,166	2,761
e.	*Anchoviella*	11,990	7,726	5,162	4,378	9,105	10,745	10,873	7,869	13,388	7,447	11,061
f.	*Thrissocles*	3,395	4,183	4,968	5,278	4,821	4,645	3,127	8,362	3,008	4,719	5,542
g.	Other clupeids	2,397	2,323	2,193	3,107	3,706	2,815	5,406	15,851	2,652	3,043	3,564
6. a.	*Harpodon nehereus*	99	2	13	48	235	—	1	—	14	—	1
b.	*Saurida & Saurus*	1,636	1,213	1,395	923	871	1,196	1,026	823	572	1,100	1,498
7.	*Hemirhamphus & Belone*	426	813	492	403	675	3,949	1,482	717	1,574	759	624
8.	Flying fish	3,768	2,103	8,375	1,290	6,221	726	1,657	1,232	526	1,092	1,599
9.	Perches	7,590	5,857	5,743	6,350	4,914	8,426	8,153	5,341	7,918	9,241	5,919
10.	Red mullets	948	1,164	1,268	1,311	1,010	1,959	1,566	626	832	1,963	1,448
11.	Polynemids	1,551	1,921	1,615	906	1,806	877	1,339	1,944	1,592	706	353
12.	Sciaenids	8,586	10,045	5,495	6,221	10,607	9,943	10,096	10,562	13,756	14,239	18,948
13.	Ribbon fish	6,500	6,833	10,897	10,498	9,625	8,369	17,782	19,054	4,594	28,664	21,040
14. a.	*Caranx*	8,642	6,541	8,486	7,109	5,624	5,188	6,225	7,082	6,120	3,104	7,022
b.	*Chorinemus*	1,089	1,218	1,343	1,045	843	1,541	1,090	646	1,465	971	844
c.	*Trachynotus*	143	143	11	—	—	2	—	28	73	84	182
d.	Other carangids	3	24	24	29	9	2	8	907	22	171	23
e.	*Coryphaena*	220	178	41	24	32	77	65	105	58	18	37
f.	*Elacate*	218	169	31	280	75	101	87	217	230	239	535
15. a.	*Leiognathus*	22,789	27,071	18,913	21,564	22,133	23,906	20,142	29,664	17,783	30,281	42,886
b.	*Gazza*	94	74	5	62	34	28	29	6	54	104	197
16.	*Lactarius*	1,028	977	640	1,348	2,823	722	1,822	775	740	840	1,323
17.	Pomfrets	1,647	1,786	834	461	1,705	720	1,303	822	628	789	877
18.	Mackerel	1,893	2,040	2,983	7,838	8,843	2,639	5,826	10,488	5,674	1,453	3,521
19.	Seer fish	2,461	2,926	5,032	6,010	5,763	5,178	4,100	3,784	6,424	4,700	5,228
20.	Tunnies	1,368	788	1,044	658	624	1,691	1,785	2,923	3,238	1,169	3,211
21.	*Sphyraena*	1,445	1,383	875	997	858	800	1,506	1,554	1,702	2,147	1,463
22.	*Mugil*	940	769	817	266	1,449	261	1,566	285	923	829	229
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.	Soles	662	672	689	518	683	1,247	785	909	908	1,580	2,337
25. a.	Penaeid prawns	5,526	4,724	3,637	4,885	4,504	8,060	11,460	8,864	8,197	13,327	10,222
b.	Non-penaeid prawns	288	540	62	148	1,285	46	573	169	159	585	897
c.	Lobsters	—	—	—	—	—	—	465	525	286	249	340
d.	Crabs & other crustaceans	4,789	4,420	6,059	9,518	7,719	9,752	13,896	16,413	11,018	9,290	5,883
26.	Cephalopods	293	77	389	248	426	955	2,953	1,451	1,375	1,042	1,903
27.	Miscellaneous	5,899	5,484	7,255	7,297	9,924	7,754	16,128	11,808	19,204	19,107	17,181
	TOTAL	1,51,876	1,55,516	1,60,619	1,55,153	1,82,419	1,75,713	2,21,215	2,26,078	2,06,046	2,12,899	2,35,008

Table 10. *Composition of marine fish landings in Pondicherry during 1969 to 1979 (In tonnes)*

Sl. No.	Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.	Elasmobranchs	277	436	848	492	322	186	129	165	352	199	222
2.	Eels	188	17	103	1	2	3	4	6	5	—	88
3.	Catfishes	139	148	360	72	122	65	55	66	137	168	51
4.	*Chirocentrus*	185	266	277	153	291	58	50	63	63	111	167
5. a.	Oil sardine	—	—	—	—	—	—	—	—	—	—	—
b.	Lesser sardines	1,530	1,752	1,807	724	500	1,203	1,046	1,839	1,156	1,184	1,998
c.	*Hilsa illsha*	—	—	5	—	—	—	31	—	—	—	—
d.	Other *Hilsa*	6	74	159	93	157	173	277	121	43	108	12
e.	*Anchoviella*	2,284	2,480	697	439	695	692	412	178	548	521	346
f.	*Thrissocles*	400	805	338	442	619	519	337	565	405	258	429
g.	Other clupeids	513	501	106	141	66	71	50	1	—	281	345
6. a.	*Harpodon nehereus*	2	—	—	—	—	—	—	—	—	—	—
b.	*Saurida & Saurus*	101	111	276	122	103	26	44	105	103	132	262
7.	*Hemirhamphus & Belone*	—	1	26	3	—	21	55	2	4	—	6
8.	Flying fish	218	253	492	42	18	110	142	165	3	480	854
9.	Perches	234	252	510	277	405	132	389	769	391	487	1,004
10.	Red mullets	35	104	132	66	121	76	100	77	32	109	203
11.	Polynemids	27	26	16	15	20	25	14	26	5	27	14
12.	Sciaenids	895	481	391	546	626	250	212	434	258	374	306
13.	Ribbon fish	698	322	96	402	434	236	314	428	143	139	129
14. a.	*Caranx*	589	233	1,004	311	227	472	610	501	490	218	537
b.	*Chorinemus*	26	3	22	—	—	2	—	2	5	33	27
c.	*Trachynotus*	—	—	—	—	—	—	—	—	—	—	—
d.	Other carangids	—	—	—	—	—	—	—	—	—	—	—
e.	*Coryphaena*	8	1	—	—	3	5	—	7	2	3	2
f.	*Elacate*	—	—	7	—	—	—	—	—	1	—	—
15. a.	*Leiognathus*	556	661	593	412	546	249	511	482	318	372	746
b.	*Gazza*	—	—	—	—	—	—	—	—	7	—	—
16.	*Lactarius*	77	83	53	17	2	12	30	121	175	—	11
17.	Pomfrets	127	105	48	67	82	24	13	44	53	50	35
18.	Mackerel	500	510	650	3,317	2,649	2,317	2,259	1,598	398	179	424
19.	Seer fish	33	83	76	25	46	68	23	28	34	41	105
20.	Tunnies	2	2	16	1	—	9	—	1	—	3	1
21.	*Sphyraena*	14	35	97	3	1	28	27	15	9	25	22
22.	*Mugil*	—	46	7	15	19	1	31	4	14	26	27
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.	Soles	36	63	119	65	214	48	125	254	78	109	162
25. a.	Penaeid prawns	614	447	289	177	33	27	62	93	103	245	532
b.	Non-penaeid prawns	—	—	1	5	8	2	2	—	2	71	72
c.	Lobsters	—	—	—	—	—	—	25	33	20	2	5
d.	Crabs & other crustaceans	156	92	178	408	194	201	260	516	296	251	242
26.	Cephalopods	25	9	52	22	20	28	58	211	62	36	50
27.	Miscellaneous	142	222	603	105	137	359	453	1,203	747	586	632
	TOTAL	10,637	10,624	10,454	8,980	8,682	7,698	8,150	10,123	6,462	6,828	10,068

Table 11. *Composition of marine fish landings in Kerala during 1969 to 1979 (In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	5,759	7,490	4,889	6,986	8,852	10,338	10,292	7,308	5,796	9,302	6,954
2.		Eels	9	1	31	5	3	49	12	10	6	38	10
3.		Catfishes	6,245	16,380	15,189	12,636	17,438	33,526	32,603	12,743	7,947	9,125	11,328
4.		*Chirocentrus*	308	877	464	397	544	860	605	807	547	1,298	1,125
5.	a.	Oil sardine	1,39,983	1,91,683	1,94,977	1,04,426	1,22,783	1,02,135	97,183	1,23,937	1,17,356	1,19,937	1,16,834
	b.	Lesser sardines	9,485	6,139	11,403	6,790	62,421	31,335	33,652	34,305	20,754	11,713	15,914
	c.	*Hilsa ilisha*	—	—	9	19	—	—	10	12	36	182	6
	d.	Other *Hilsa*	—	13	6	3	39	33	—	—	14	69	36
	e.	*Anchoviella*	10,486	7,948	10,842	10,672	8,940	19,463	11,432	9,987	10,105	21,203	6,552
	f.	*Thrissocles*	1,166	4,610	2,349	2,001	1,663	1,321	1,638	2,732	1,648	1,898	1,789
	g.	Other clupeids	1,589	1,566	1,668	1,346	1,158	1,323	998	1,174	512	973	674
6.	a.	*Harpodon nehereus*	—	—	1	43	45	18	—	—	—	21	1
	b.	*Saurida & Saurus*	546	1,066	1,395	1,426	1,136	8,839	11,294	99	5,169	6,246	5,326
7.		*Hemirhamphus & Belone*	83	30	97	88	185	331	278	141	281	281	257
8.		Flying fish	—	3	2	—	1	2	—	1	—	—	—
9.		Perches	2,340	4,336	3,663	3,939	8,663	20,970	14,741	3,069	14,121	24,989	20,239
10.		Red mullets	1,548	279	1,573	2,960	1,537	3,881	23	2,577	240	171	127
11.		Polynemids	142	22	569	24	570	3	105	122	69	35	29
12.		Sciaenids	3,195	5,792	4,145	6,137	11,723	9,220	16,811	6,955	11,965	13,045	5,237
13.		Ribbon fish	7,446	4,922	17,380	10,459	23,897	30,192	15,175	7,687	7,440	24,207	25,718
14.	a.	*Caranx*	3,542	2,563	4,952	14,848	14,283	5,260	7,190	10,478	15,673	7,197	12,339
	b.	*Chorinemus*	55	77	49	817	48	72	135	265	540	148	128
	c.	*Trachynotus*	6	—	6	2	—	—	6	—	7	19	—
	d.	Other carangids	4	38	3	36	36	73	85	6	78	72	—
	e.	*Coryphaena*	1	1	1	92	153	94	61	56	28	19	48
	f.	*Elacate*	51	118	299	76	52	35	62	106	158	166	120
15.	a.	*Leiognathus*	14,019	16,167	8,609	5,042	18,388	17,518	5,211	2,727	7,708	3,040	3,597
	b.	*Gazza*	—	—	21	15	4	5	—	—	—	—	—
16.		*Lactarius*	1,301	1,443	2,991	3,034	6,663	2,904	983	468	823	1,533	253
17.		Pomfrets	1,177	693	2,416	1,932	1,809	1,500	1,181	799	3,712	1,614	1,737
18.		Mackerel	29,981	54,659	95,164	34,516	19,780	10,335	14,930	19,978	19,968	25,917	18,585
19.		Seer fish	1,010	1,731	2,800	1,386	1,690	4,909	4,065	5,936	3,250	3,354	6,275
20.		Tunnies	978	1,226	3,043	3,626	2,699	5,927	5,845	12,880	6,705	6,548	15,391
21.		*Sphyraena*	339	79	174	1,125	2,333	3,865	396	494	353	721	477
22.		*Mugil*	64	154	549	91	103	955	74	26	38	1	39
23.		*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.		Soles	10,039	10,212	8,807	6,119	8,551	12,771	6,932	3,567	5,778	7,276	4,487
25.	a.	Penaeid prawns	34,334	36,940	31,294	35,866	84,770	59,815	77,207	34,478	40,150	45,034	29,522
	b.	Non-penaeid prawns	34	14	1,519	711	981	1,014	755	55	174	394	75
	c.	Lobsters	—	—	—	—	—	—	31	50	40	38	26
	d.	Crabs & other crustaceans	435	556	523	158	1,781	2,886	1,797	1,316	4,621	2,176	7,643
26.		Cephalopods	164	86	473	350	339	2,175	3,342	872	4,973	6,516	2,976
27.		Miscellaneous	6,923	12,966	11,002	15,419	12,208	14,305	43,696	22,824	26,254	16,823	8,635
		TOTAL	2,94,787	3,92,880	4,45,347	2,95,618	4,48,269	4,20,257	4,20,836	3,31,047	3,45,037	3,73,339	3,30,509

decline observed in 1979 was mainly due to the decrease in the landings of penaeid prawns (15,500 t), *Anchoviella* (14,600 t), sciaenids (7,800 t), mackerel (7,300 t) cephalopods (3,500 t), oil sardine (3,000 t), soles, (2,800 t), and elasmobranchs (2,300 t). The substantial decline in the catch of penaeid prawns in Sakthikulangara during 1979 was mainly responsible for the overall decline in the landings of penaeid prawns in the state. An increase in the catch of tunnies (8,800 t), other crustaceans (5,500 t), *Caranx* (5,100 t), lesser sardines (4,200 t) and catfish (2,200 t), however, was noticed. Table 11 shows the species composition of marine fish landings in Kerala during the period 1969 to 1979.

Karnataka

A decline in the total catch to the tune of about 26,500 t as compared to last year was noticed. This may be attributed largely to the decline in the landings of oil sardine and mackerel by about 13,600 t and 10,600 t respectively. The landings of penaeid prawns also showed a decrease of about 3,800 t. However, the catch of cat fishes showed an increase of about 7,100 t. The specieswise composition of total marine fish landings in Karnataka State during 1969 to 1979 is shown in Table 12.

Goa

A minor fall of about 1,700 t in the total landings was observed during 1979. The catch of lesser sardines, sciaenids, perches and catfish decreased by about 2,700, 1,800, 600 and 500 t respectively. Oil sardine and mackerel, however, improved by about 1,600 and 1,000 t respectively. Table 13 gives the details of species composition of total fish landings during the years 1969 to 1979.

Maharashtra

During 1979, the total catch registered an increase of about 9,000 t as compared to 1978. The landings of non-penaeid prawns, penaeid prawns and sciaenids showed an increase of about 12,000, 4,500 and 4,200 t respectively. Bombay duck landings, however, decreased about 9,000 t. The species composition of total marine fish landings in Maharashtra during 1969 to 1979 is shown in Table 14.

Gujarat

The total fish catch in Gujarat declined marginally by about 10,600 t. The catch of other clupeids, elasmobranchs, pomfrets and sciaenids, decreased by about 7,700, 6,600, 5,800, and 5,700 t respectively. There has been an increase in the landings of Bombay duck during 1979 by about 10,000 t as compared to last year. Table 15 shows the species composition of marine fish landing in Gujarat for the period 1969 to 1979.

Andamans

The total landings in Andamans increased marginally. No large scale changes were seen in the species composition of total catch during 1979 as compared to 1978. The species composition of total marine fish catch in Andamans for the years 1969 to 1979 is shown in Table 16.

Lakshadweep

An increase of about 1,100 t in the total catch was noticed during 1979 as compared to 1978. This was mainly due to increased landings of tunnies by about 900 t and elasmobranchs by about 200 t. Table 17 shows the species composition of total marine fish catch in Lakshadweep during 1969 to 1979.

Major groups of fishes

From Table 2 it is noticed that oil sardine accounted for 153,971 t forming about 11.09% of the total all India catch during 1979. The other major group of species in the order of abundance are Bombay duck (126,044 t—9.08%) penaeid prawns (113,665 t—8.19%), sciaenids (93,018 t—6.70%), mackerel (71,514 t—5.15%) ribbon fish (71,349 t—5.14%), lesser sardines (68,351 t—4.92%), non-penaeid prawns (63,917 t—4.60%), and silver bellies (55,463 t—3.99%).

Oil Sardine

The oil sardine catch during 1979 showed a decline of about 14,000 t as compared to 1978. This was due to reduced landings in the states of Kerala and Karnataka. The oil sardine landings during 1969 to 1979 showed wide fluctuation (Table 4 and Fig. 2). While the catch in 1970 was the highest recorded so far, the landings during 1974 were the lowest. The catch during 1979 formed about 68% of the highest catch recorded in 1970.

Bombay duck

The overall catch of Bombay duck remained more or less same as that of last year. An improvement in

Table 12. *Composition of marine fish landings in Karnataka during 1969 to 1979 (In tonnes)*

Sl. No.	Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.	Elasmobranchs	1,130	1,416	2,753	4,587	1,690	2,007	1,726	1,489	3,238	2,051	2,531
2.	Eels	8	—	—	8	8	8	81	—	3	8	1
3.	Catfishes	3,857	9,220	1,331	3,184	2,372	2,011	3,222	4,279	5,162	2,831	9,920
4.	*Chirocentrus*	151	124	176	343	219	684	412	184	717	247	258
5. a.	Oil sardine	33,580	33,834	11,836	15,610	15,495	20,784	52,701	41,451	31,145	46,707	33,080
b.	Lesser sardines	3,962	2,034	491	1,563	1,164	228	775	641	180	2,572	4,753
c.	*Hilsa ilisha*	1	21	18	785	50	459	1	—	44	9	10
d.	Other *Hilsa*	29	94	14	5	33	1	10	30	113	30	52
e.	*Anchoviella*	236	142	97	124	235	51	10	54	174	443	1,721
f.	*Thrissocles*	189	1,009	180	575	263	1,079	344	900	831	919	441
g.	Other clupeids	976	966	365	698	690	957	568	457	1,677	872	2,278
6. a.	*Harpodon nehereus*	20	53	10	1	17	5	2	7	4	4	5
b.	*Saurida & Saurus*	2	75	351	18	—	3	75	187	385	92	155
7.	*Hemirhamphus & Belone*	161	182	38	27	18	5	36	87	57	41	49
8.	Flying fish	—	—	—	1	—	—	—	—	—	—	—
9.	Perches	52	67	132	177	122	203	727	454	1,489	174	181
10.	Red mullets	—	31	9	65	3	—	3	145	19	31	30
11.	Polynemids	20	20	1	69	8	16	3	—	3	3	2
12.	Sciaenids	1,187	1,885	1,313	2,114	1,013	3,208	1,853	3,216	2,762	1,728	2,348
13.	Ribbon fish	144	280	330	748	138	303	219	583	237	404	1,193
14. a.	*Caranx*	1,585	860	440	516	1,226	771	746	656	760	202	1,103
b.	*Chorinemus*	25	—	5	286	12	72	55	80	506	13	59
c.	*Trachynotus*	—	—	—	—	—	115	49	—	—	3	13
d.	Other carangids	—	—	—	—	—	11	92	—	41	43	1
e.	*Coryphaena*	—	—	—	—	—	—	23	—	—	—	—
f.	*Elacate*	9	11	8	3	220	54	31	32	1	55	34
15. a.	*Leiognathus*	1,909	1,334	1,321	795	2,659	2,058	1,240	4,086	1,631	4,241	1,565
b.	*Gazza*	—	—	—	—	—	—	—	—	—	—	—
16.	*Lactarius*	292	562	487	899	1,740	1,546	495	216	101	198	433
17.	Pomfrets	341	354	866	618	1,153	303	213	438	249	1,957	250
18.	Mackerel	13,253	46,337	64,047	32,249	35,468	9,696	12,469	22,455	26,214	50,704	40,084
19.	Seer fish	720	1,552	2,506	2,498	1,313	1,532	776	1,341	1,831	1,463	1,645
20.	Tunnies	109	4	515	134	124	394	212	576	622	614	1,717
21.	*Sphyraena*	5	—	21	32	130	26	14	9	3	276	41
22.	*Mugil*	64	38	—	12	33	—	8	6	—	1	—
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.	Soles	325	628	656	1,594	626	2,377	373	637	985	1,820	874
25. a.	Penaeid prawns	3,980	7,538	4,420	8,058	8,235	12,695	3,074	2,594	3,335	8,422	4,654
b.	Non-penaeid prawns	—	1	—	17	1	1	—	—	—	18	6
c.	Lobsters	—	—	—	—	—	—	12	8	4	39	15
d.	Crabs & other crustaceans	26	34	1,763	346	934	1,742	2,540	156	207	741	2,740
26.	Cephalopods	57	11	7	25	19	20	175	3,067	965	1,346	68
27.	Miscellaneous	7,388	6,219	7,217	13,892	14,053	10,838	2,129	4,762	11,457	21,538	12,074
	TOTAL	75,793	1,16,936	1,03,724	92,676	91,484	76,263	87,494	95,283	97,152	1,52,860	1,26,384

Table 13. *Composition of marine fish landings in Goa during 1969 to 1979 (In tonnes)*

Sl. No.	Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.	Elasmobranchs	138	163	229	299	199	387	572	1,038	625	863	1,280
2.	Eels	—	—	—	—	—	—	64	1	—	55	35
3.	Catfishes	115	85	84	281	230	348	1,367	834	918	1,356	846
4.	*Chirocentrus*	3	11	13	21	34	78	32	54	32	78	122
5. a.	Oil sardine	—	1,134	1,994	3,793	3,426	2,106	7,526	1,385	807	1,398	3,030
b.	Lesser sardines	1,343	2,694	72	2,165	1,272	1,172	3,914	11,100	4,066	5,151	2,471
c.	*Hilsa ilisha*	—	—	—	—	—	—	—	—	—	3	2
d.	Other *Hilsa*	—	—	—	—	—	—	—	—	1	2	14
e.	*Anchoviella*	35	34	44	123	146	—	31	—	9	5	—
f.	*Thrissocles*	—	—	—	—	—	81	123	290	293	1,308	911
g.	Other clupeids	50	36	260	8	120	276	419	667	520	645	378
6. a.	*Harpodon nehereus*	—	2	2	—	—	—	10	46	20	27	9
b.	*Saurida & Saurus*	4	1	—	—	—	1	151	25	239	279	104
7.	*Hemirhamphus & Belone*	—	—	—	—	—	—	—	8	13	56	13
8.	Flying fish	—	—	—	—	—	—	—	—	—	2	1
9.	Perches	4	—	—	26	4	9	45	310	505	781	203
10.	Red mullets	—	1	—	—	6	34	77	—	—	—	—
11.	Polynemids	—	4	15	13	13	44	63	—	1	1	—
12.	Sciaenids	86	97	106	280	171	883	3,048	2,640	2,779	3,256	1,492
13.	Ribbon fish	134	60	23	12	48	111	355	1,123	449	504	548
a.	*Caranx*	2	—	—	4	2	952	1,078	794	1,149	1,803	1,343
b.	*Chorinemus*	1	1	—	—	—	4	—	100	44	56	140
c.	*Trachynotus*	—	—	—	—	—	—	—	3	—	—	—
d.	Other carangids	—	—	—	—	—	—	—	—	—	—	—
e.	*Coryphaena*	—	—	—	—	—	—	—	—	—	—	—
f.	*Elacate*	—	—	—	—	—	—	—	—	23	52	190
15. a.	*Leiognathus*	471	332	156	287	152	1,420	604	896	458	704	881
b.	*Gazza*	—	—	—	—	—	—	—	3	—	—	—
16.	*Lactarius*	7	14	5	113	170	373	189	338	375	443	291
17.	Pomfrets	8	15	24	31	24	96	102	100	296	367	138
18.	Mackerel	23,872	14,585	35,258	19,999	7,616	7,905	6,779	6,448	7,661	3,371	4,391
19.	Seer fish	34	36	108	67	66	273	222	501	213	691	1,101
20.	Tunnies	—	2	—	—	—	—	2	23	107	300	742
21.	*Sphyraena*	1	—	—	—	—	—	—	—	—	7	7
22.	*Mugil*	4	—	—	18	—	5	124	4	46	32	14
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.	Soles	284	119	64	221	95	196	16	137	335	417	893
25. a.	Penaeid prawns	559	627	279	561	785	1,448	1,762	4,643	1,436	1,647	1,594
b.	Non-penaeid prawns	—	—	—	—	—	—	—	—	24	26	—
c.	Lobsters	—	—	—	—	—	—	6	3	7	13	6
d.	Crabs & other crustaceans	5	5	11	7	20	86	227	971	637	531	1,379
26.	Cephalopods	—	—	—	5	—	14	96	142	164	124	173
27.	Miscellaneous	399	678	1,233	1,770	1,141	1,232	166	341	479	757	646
	TOTAL	27,559	20,736	39,980	30,104	15,740	19,534	29,170	34,968	24,731	27,111	25,388

Table. 14. *Composition of marine fish landings in Maharashtra during* 1969 *to* 1979 *(In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	6,835	4,374	4,470	5,937	7,624	6,538	8,167	7,089	7,746	10,072	12,516
2.		Eels	2,339	5,396	2,864	3,190	2,026	674	1,101	4,168	3,849	5,384	4,033
3.		Catfishes	6,776	10,817	18,052	12,821	9,226	7,240	8,236	9,522	8,318	11,081	10,433
4.		*Chirocentrus*	1,655	720	1,207	1,268	2,152	1,135	2,936	2,409	2,634	3,059	1,721
5.	a.	Oil sardine	399	300	407	3,593	2,483	1,083	1,699	2,377	108	—	16
	b.	Lesser sardines	1,223	3,404	1,864	2,877	3,077	1,238	3,103	1,963	1,024	868	927
	c.	*Hilsa ilisha*	34	—	22	13	89	4	16	154	352	1,558	1,071
	d.	Other *Hilsa*	1,012	1,542	1,121	1,399	849	800	1,152	661	978	466	429
	e.	*Anchoviella*	68	484	990	209	573	272	533	209	269	340	382
	f.	*Thrissocles*	699	745	1,574	1,236	3,008	869	927	1,276	1,679	1,821	2,832
	g.	Other clupeids	8,342	6,493	8,781	9,484	15,018	13,892	21,172	16,944	22,782	13,608	15,675
6.	a.	*Harpodon nehereus*	25,171	33,730	33,993	21,246	34,179	29,989	51,645	49,470	50,803	68,781	59,667
	b.	*Saurida & Saurus*	283	165	148	577	987	637	218	1,089	1,135	1,815	2,374
7.		*Hemirhamphus & Belone*	251	432	127	108	117	33	52	30	32	51	126
8.		Flying fish	—	1	49	13	1	2	2	—	—	5	1
9.		Perches	1,694	2,084	853	1,379	3,195	2,111	2,484	1,460	2,973	6,951	3,225
10.		Red mullets	675	268	514	1,133	987	701	103	497	171	344	859
11.		Polynemids	611	3,287	987	2,174	2,333	1,797	1,628	4,125	862	1,909	1,600
12.		Sciaenids	10,733	12,906	13,339	11,299	14,319	17,453	20,576	19,781	17,086	17,202	21,366
13.		Ribbon fish	4,794	4,968	6,562	8,544	13,363	9,585	9,435	10,052	6,338	10,400	10,983
14.	a.	*Caranx*	3,899	4,383	2,280	1,371	804	2,535	2,240	1,179	1,167	1,899	2,314
	b.	*Chorinemus*	876	276	87	171	445	179	145	121	230	300	416
	c.	*Trachynotus*	—	—	—	—	189	5	3	3	—	—	—
	d.	Other carangids	—	868	134	29	84	4	—	654	—	50	385
	e.	*Coryphaena*	—	—	—	—	4	9	11	2	—	—	51
	f.	*Elacate*	1	199	—	6	126	21	15	—	—	—	—
15.	a.	*Leiognathus*	906	242	231	268	955	473	200	—	358	323	724
	b.	*Gazza*	—	74	126	—	—	293	293	—	—	—	—
16.		*Lactarius*	529	585	288	322	760	431	431	643	247	836	430
17.		Pomfrets	12,776	4,210	5,787	6,858	8,209	6,683	8,351	17,979	17,295	13,050	14,941
18.		Mackerel	20,685	17,198	4,650	5,507	2,368	2,587	1,860	1,944	875	787	1,455
19.		Seer fish	2,570	1,496	1,509	2,089	1,769	1,434	1,850	2,116	3,220	2,915	4,027
20.		Tunnies	123	278	292	294	743	286	274	463	312	1,939	1,772
21.		*Sphyraena*	27	—	—	54	21	21	17	50	—	388	82
22.		*Mugil*	286	74	72	55	65	22	30	191	48	102	38
23.		*Bregmaceros*	1,684	2,196	4,345	5,488	4,213	1,806	1,043	380	30	21	276
24.		Soles	410	1,440	904	553	2,737	502	487	1,553	1,245	1,676	2,304
25.	a.	Penaeid prawns	14,545	28,920	18,974	20,173	16,894	14,712	24,653	40,772	26,675	41,091	45,638
	b.	Non-penaeid prawns	31,235	28,425	74,637	83,952	63,455	50,025	69,012	63,702	66,978	44,255	56,208
	c.	Lobsters	—	—	—	—	—	—	245	419	434	607	499
	d.	Crabs & other crustaceans	144	5,625	979	487	687	973	550	51	93	148	519
26.		Cephalopods	147	326	368	282	501	298	482	2,488	596	4,557	3,959
27.		Miscellaneous	4,283	3,430	1,718	3,543	6,061	5,609	9,242	25,615	15,510	13,585	7,052
		Total	1,68,720	1,92,361	2,15,305	2,20,002	2,26,696	1,84,961	2,56,619	2,93,601	2,64,452	2,84,244	2,93,326

Table 15. *Composition of marine fish landings in Gujarat during 1969 to 1979 (In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	3,657	5,755	6,249	6,572	3,995	10,227	11,930	7,896	17,565	11,511	4,926
2.		Eels	152	963	796	1,124	1,396	2,446	2,497	3,283	8,463	1,886	2,622
3.		Catfishes	2,453	4,021	3,570	3,905	2,071	5,548	2,514	2,140	8,958	4,159	5,320
4.		*Chirocentrus*	592	905	2,363	2,435	1,295	1,722	2,325	2,155	3,327	1,869	1,970
5.	a.	Oil sardine	23	—	—	—	—	—	—	—	—	—	—
	b.	Lesser sardines	21	33	43	368	—	—	—	8	—	—	—
	c.	*Hilsa ilisha*	461	658	624	165	48	258	3,394	1,098	329	49	231
	d.	Other *Hilsa*	3,150	4,540	5,405	5,536	6,500	3,292	3,846	3,367	5,547	5,703	3,837
	e.	*Anchoviella*	—	—	—	9	—	—	130	—	—	—	—
	f.	*Thrissocles*	135	619	217	113	174	239	117	269	105	608	686
	g.	Other clupeids	5,111	4,751	3,372	3,983	1,995	11,557	13,192	11,098	9,458	13,282	5,552
6.	a.	*Harpodon nehereus*	49,484	43,618	35,680	29,011	27,664	29,675	44,554	34,998	32,289	53,870	63,984
	b.	*Saurida & Saurus*	—	—	—	1,169	563	1,546	1,267	2,797	42	82	6
7.		*Hemirhamphus & Belone*	1	2	1	5	2	5	3	101	104	1	185
8.		Flying fish	—	—	—	—	—	127	—	—	—	—	—
9.		Perches	265	498	383	1,394	2,403	2,462	3,261	4,641	1,213	4,174	973
10.		Red mullets	8	—	—	—	1	1	—	680	779	2	8
11.		Polynemids	159	1,015	2,391	1,626	2,969	5,331	8,832	6,230	268	339	736
12.		Sciaenids	2,211	3,989	3,433	3,806	40,324	24,275	45,781	28,698	39,968	33,968	28,230
13.		Ribbon fish	1,455	1,656	1,145	1,447	938	1,849	1,097	12,341	14,180	6,944	4,491
14.	a.	*Caranx*	736	371	771	229	242	1,068	1,012	1,642	1,002	270	510
	b.	*Chorinemus*	9	252	—	7	251	95	—	14	401	320	466
	c.	*Trachynotus*	—	—	—	—	—	—	—	—	—	—	—
	d.	Other carangids	—	—	128	214	—	—	14	—	—	—	—
	e.	*Coryphaena*	—	—	—	—	—	—	—	—	—	—	—
	f.	*Elacate*	—	—	—	—	—	—	—	14	—	—	—
15.	a.	*Leiognathus*	8	8	82	—	—	2	1	908	—	—	—
	b.	*Gazza*	—	—	—	—	—	—	—	—	—	—	—
16.		*Lactarius*	—	—	—	421	765	987	5,379	7,765	7,349	3,360	783
17.		Pomfrets	5,468	7,978	6,781	4,234	4,249	8,029	5,612	2,116	9,174	15,141	9,319
18.		Mackerel	15	—	1	—	—	—	—	—	—	—	35
19.		Seer fish	1,030	1,043	2,524	2,850	4,110	686	1,879	1,634	2,022	3,734	2,682
20.		Tunnies	—	—	1	1	268	579	546	734	332	451	442
21.		*Sphyraena*	—	—	—	36	29	54	26	9	154	—	—
22.		*Mugil*	1,006	1,116	1,674	847	1,116	1,291	600	1,097	900	1,264	751
23.		*Bregmaceros*	—	—	—	—	—	66	—	—	—	163	362
24.		Soles	86	82	54	392	1,525	1,456	2,991	2,969	729	268	411
25.	a.	Penaeid prawns	2,622	2,653	2,873	2,013	10,550	5,970	13,395	11,497	8,861	7,938	8,606
	b.	Non-penaeid prawns	651	946	141	218	70	149	2,386	7,778	1,260	3,096	3,347
	c.	Lobsters	—	—	—	—	—	39	2,105	1,491	424	339	211
	d.	Crabs & other crustaceans	1	—	3	393	749	5	10	224	2,471	584	783
26.		Cephalopods	1	—	—	3	1	7	611	2,286	1,439	1,959	5,351
27.		Miscellaneous	1,277	1,555	1,454	1,320	5,700	24,266	12,468	7,316	10,525	24,595	33,496
		TOTAL	82,248	89,027	82,159	75,846	1,21,963	1,45,309	1,93,775	1,71,294	1,89,638	2,01,929	1,91,312

Table 16. *Composition of marine fish landings in Andamans during* 1969 *to* 1979 *(In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	18	21	22	18	33	27	48	72	90	89	88
2.		Eels	—	—	—	—	—	—	—	1	—	—	—
3.		Catfishes	13	10	14	15	8	14	15	19	28	33	55
4.		*Chirocentrus*	8	12	11	13	5	18	35	33	38	40	45
5.	a.	Oil sardine	—	—	—	—	—	—	—	—	—	—	—
	b.	Lesser sardines	42	46	48	62	67	55	66	86	86	97	132
	c.	*Hilsa ilisha*	—	—	—	—	—	—	—	—	—	—	—
	d.	Other *Hilsa*	1	1	6	11	5	7	13	28	25	31	42
	e.	*Anchoviella*	38	41	36	67	67	53	79	118	103	92	119
	f.	*Thrissocles*	—	—	—	—	—	—	—	—	—	—	—
	g.	Other clupeids	16	6	9	12	5	18	9	—	11	18	33
6.	a.	*Harpodon nehereus*	—	—	—	—	—	—	—	—	—	—	—
	b.	*Saurida & Saurus*	—	—	—	—	—	—	—	—	—	—	—
7.		*Hemirhamphus & Belone*	6	9	17	13	10	9	16	35	53	61	88
8.		Flying fish	—	—	—	—	—	—	—	—	—	—	—
9.		Perches	75	74	79	87	103	114	157	142	196	234	239
10.		Red mullets	—	—	—	—	—	—	—	2	4	—	—
11.		Polynemids	—	—	—	—	—	—	—	—	—	—	—
12.		Sciaenids	—	—	—	—	—	—	—	5	—	—	—
13.		Ribbon fish	—	—	—	—	—	—	—	—	—	1	3
14.	a.	*Caranx*	44	56	64	87	106	81	108	125	134	133	134
	b.	*Chorinemus*	—	—	—	—	—	—	—	—	—	—	—
	c.	*Trachynotus*	—	—	—	—	—	—	—	—	—	—	—
	d.	Other carangids	—	—	—	—	—	—	—	—	—	—	—
	e.	*Coryphaena*	—	—	—	—	—	—	—	—	—	—	—
	f.	*Elacate*	—	—	—	—	—	—	—	—	—	—	—
15.	a.	*Leiognathus*	23	28	41	54	50	47	80	117	97	89	78
	b.	*Gazza*	—	—	—	—	—	—	—	—	—	—	—
16.		*Lactarius*	—	—	—	—	—	—	—	—	—	—	—
17.		Pomfrets	4	5	10	7	6	11	14	30	30	25	29
18.		Mackerel	22	23	22	47	100	38	115	77	111	106	92
19.		Seer fish	32	51	46	75	91	63	85	93	119	127	138
20.		Tunnies	7	9	12	9	13	7	9	13	37	57	57
21.		*Sphyraena*	8	13	18	18	13	26	25	49	76	80	95
22.		*Mugil*	28	53	52	69	80	74	84	101	130	131	121
23.		*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.		Soles	—	—	—	—	—	—	—	—	—	—	—
25.	a.	Penaeid prawns	8	10	12	12	8	28	28	39	45	38	64
	b.	Non-penaeid prawns	—	—	—	—	—	—	—	—	—	—	—
	c.	Other crustaceans	—	—	—	—	—	—	—	—	—	—	—
26.		Cephalopods	—	—	—	—	—	—	—	—	—	—	—
27.		Miscellaneous	19	32	50	104	84	230	118	149	119	97	69
		TOTAL	412	500	569	780	854	920	1,104	1,334	1,532	1,579	1,721

Table 17. *Composition of marine fish landings in Lakshadweep during* 1969 *to* 1979 *(In tonnes)*

Sl. No.		Name of fish	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1.		Elasmobranchs	137	214	120	157	171	253	325	354	296	198	364
2.		Eels	—	—	—	—	—	—	—	—	—	—	—
3.		Catfishes	—	—	—	—	—	—	1	—	—	—	—
4.		*Chirocentrus*	—	—	—	—	—	—	—	—	—	—	—
5.	a.	Oil sardine	—	—	—	—	—	—	—	—	—	—	—
	b.	Lesser sardines	4	—	—	—	—	—	—	—	—	—	—
	c.	*Hilsa ilisha*	—	—	—	—	—	—	—	—	—	—	—
	d.	Other *Hilsa*	—	—	—	—	—	—	—	—	—	—	—
	e.	*Anchoviella*	—	—	—	—	—	—	—	—	—	—	—
	f.	*Thrissocles*	—	—	—	—	—	—	—	—	—	—	—
	g.	Other clupeids	—	—	—	—	—	—	—	—	—	—	—
6.	a.	*Harpodon nehereus*	—	—	—	—	—	—	—	—	—	—	—
	b.	*Saurida & Saurus*	—	—	—	—	—	—	—	—	—	—	—
7.		*Hemirhamphus & Belone*	15	16	9	19	99	27	29	33	58	144	101
8.		Flying fish	24	20	14	17	42	43	30	41	30	33	16
9.		Perches	69	72	43	83	130	159	186	193	211	163	203
10.		Red mullets	34	33	8	12	36	32	34	58	29	27	27
11.		Polynemids	—	—	—	—	—	—	—	—	—	—	—
12.		Sciaenids	—	—	—	—	—	—	2	—	—	—	—
13.		Ribbon fish	—	—	—	—	—	—	—	—	—	—	—

Table 17 (Contd.)

14.	a. *Caranx*	46	32	20	30	63	61	61	94	65	60	58
	b. *Chorinemus*	—	—	—	—	—	—	—	—	—	—	—
	c. *Trachynotus*	—	—	—	—	—	—	—	—	—	—	—
	d. Other carangids	—	—	—	—	—	—	—	—	—	—	—
	e. *Coryphaena*	—	—	—	—	—	—	—	—	—	—	—
	f. *Elacate*	—	—	—	—	—	—	—	—	—	—	—
15.	a. *Leiognathus*	—	—	—	—	—	—	5	—	—	—	—
	b. *Gazza*	—	—	—	—	—	—	—	—	—	—	—
16.	*Lactarius*	—	—	—	—	—	—	—	—	—	—	—
17.	Pomfrets	—	—	—	—	—	—	—	—	—	—	—
18.	Mackerel	—	—	—	—	—	—	—	—	—	—	—
19.	Seer fish	63	58	48	51	29	91	66	87	41	41	24
20	Tunnies	665	571	774	514	1,020	1,254	1,932	1,291	1,166	1,875	2,794
21.	*Sphyraena*	7	6	7	8	11	18	17	20	15	18	11
22.	*Mugil*	—	—	—	—	—	—	—	—	—	—	—
23.	*Bregmaceros*	—	—	—	—	—	—	—	—	—	—	—
24.	Soles	—	—	—	—	—	—	—	—	—	—	—
25.	a. Penaeid prawns	—	—	—	—	—	—	—	—	—	—	—
	b. Non-penaeid prawns	—	—	—	—	—	—	—	—	—	—	—
	c. Other crustaceans	—	—	—	—	—	—	—	—	—	—	—
26.	Cephalopods	10	9	13	17	20	15	19	40	23	20	15
27.	Miscellaneous	119	134	134	172	232	279	224	361	281	201	233
	TOTAL	1,193	1,165	1,190	1,080	1,853	2,232	2,931	2,572	2,215	2,780	3,846

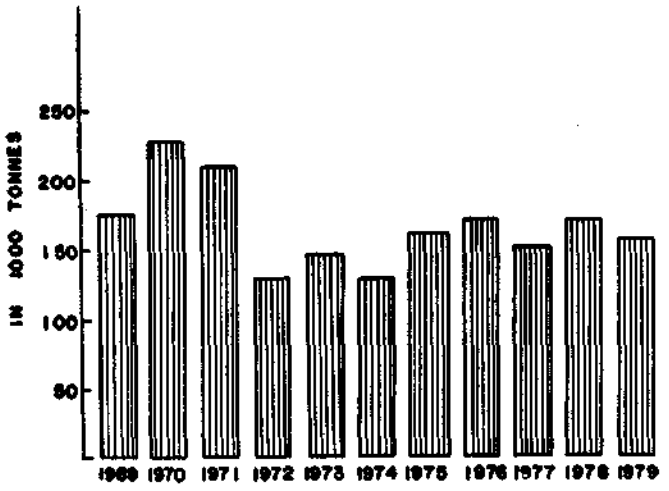


Fig. 2. Landings of oil sardine during 1969 to 1979.

the catch to the tune of about 10,000 t noticed in Gujarat was offset by a decline of about the same extent in Maharashtra. Wide fluctuations in the total catch of Bombay duck were seen during 1969 to 1979 (Table 4 and Fig. 3). The highest and the lowest catch was recorded in 1979 and 1972 respectively.

Penaeid prawns

A decline to the extent of about 15,500 t was noticed in the total catch of penaeid prawns during 1979 as compared to 1978. While Kerala, Karnataka and Tamil Nadu showed decreased landings by about 15,500, 3,800 and 3,100 t respectively, Maharashtra, Gujarat, Andhra Pradesh and Orissa showed higher landings to the tune of about 4,500, 670, 670 and 380 t respectively. Table 4 and Fig. 4 show year to year fluctuations from 1969 to 1979. While the minimum catch was seen in 1971, the maximum catch was recorded in 1975. The penaeid prawns catch in 1979 formed about 80% of the maximum catch recorded in 1975.

Sciaenids

The catch of sciaenids during 1979 showed a minor decline of about 3,000 t. While Kerala, Gujarat

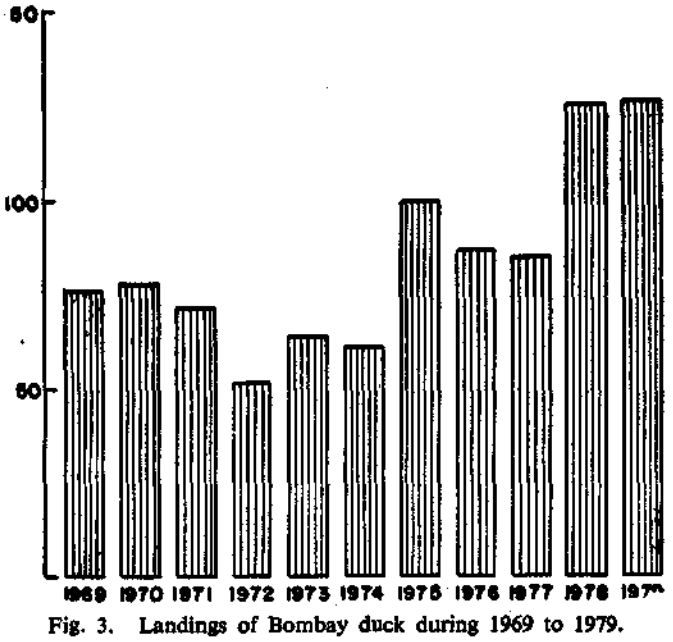


Fig. 3. Landings of Bombay duck during 1969 to 1979.

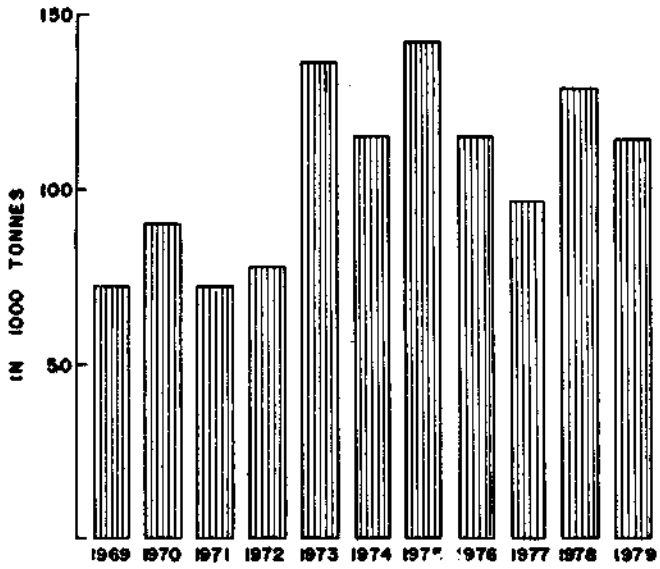


Fig. 4. Landings of penaeid prawns during 1969 to 1979.

and Goa recorded reduced landings by about 8,000, 6,000 and 2,000 t respectively, Tamil Nadu, Maharashtra, Andhra Pradesh and Karnataka accounted increased landings by about 4,700, 4,200, 3,200 and 600 t respectively. The landings during 1969 to 1979 showed wide fluctuations (Table 4 and Fig. 5). While in 1975 a maximum catch of 1,14,535 t was noticed, the minimum of 35,041 t was recorded in 1969. The catch in 1979 was about 81% of the maximum catch recorded in 1975.

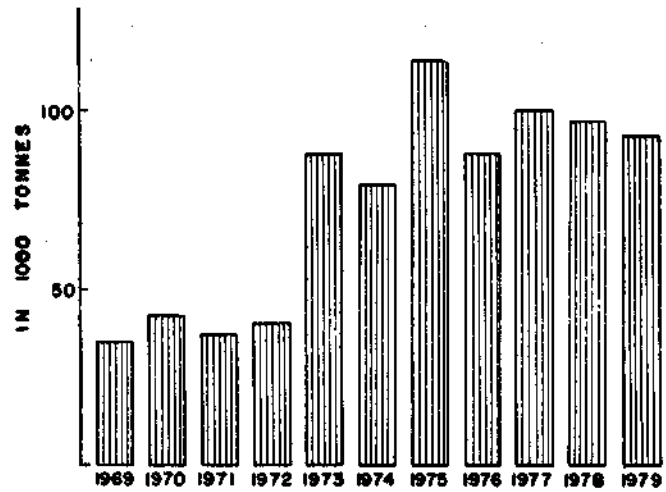


Fig. 5. Landings of sciaenids during 1969 to 1979.

Mackerel

The landings of mackerel during 1979 showed a decline of about 14,000 t as compared to 1978. This is mainly due to reduced landings in the States of Karnataka and Kerala by about 10,600 t and 7,300 t respectively. Tamil Nadu and Goa, however, recorded higher landings by about 2,000 t and 1,000 t respectively. From Table 4 and Fig. 6 it is seen that the landings of mackerel during 1969 to 1979 showed wide fluctuations. While a minimum of 37,462 t was observed in 1974, the maximum catch of 2,04,575 t was noticed in 1971. The landings in 1979 formed only 35% of the highest catch recorded in 1971.

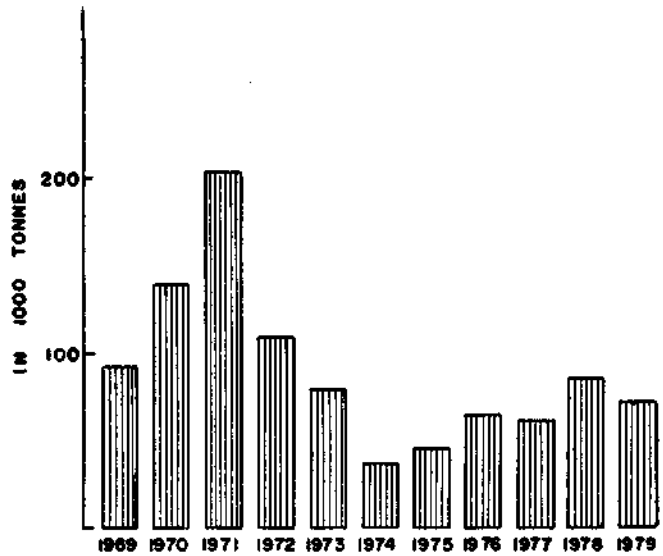


Fig. 6. Landings of mackerel during 1969 to 1979.

Ribbon fish

The total catch of ribbon fish during 1979 showed a decline of about 6,400 t as compared to 1978. This was largely due to reduced landings to the extent of 7,600 t in Tamil Nadu. In Kerala, however, the catch increased by about 1,500 t. The catch of ribbon fish showed year to year fluctuations from 1969 to 1979

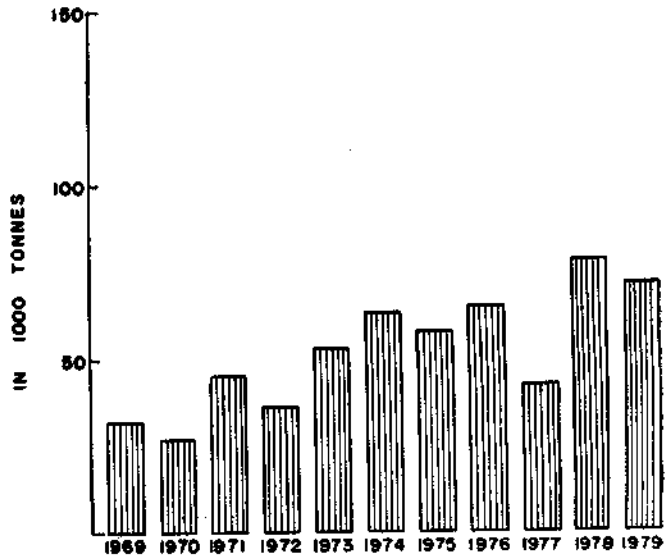


Fig. 7. Landings of ribbon fish during 1969 to 1979.

(Table 4 and Fig. 7). The minimum and maximum catch of 26,984 t and 77,785 t was recorded in 1970 and 1978 respectively. The landings during 1979 accounted for 92% of the highest catch recorded in 1978.

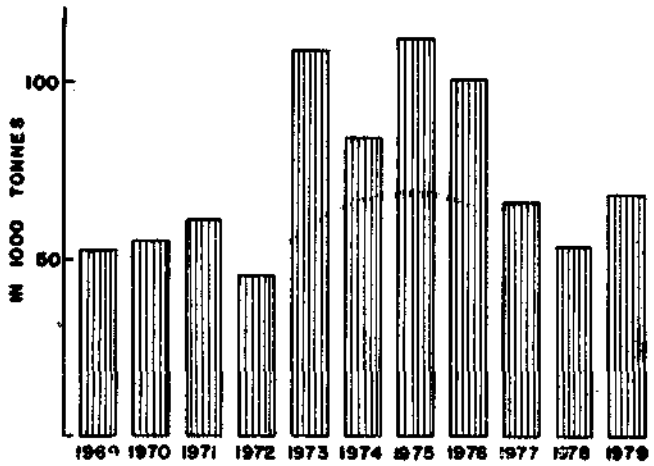


Fig. 8. Landings of lesser sardines during 1969 to 1979.

Lesser sardines

A significant increase of about 15,500 t in the total catch of lesser sardines was noticed during 1979 as compared to 1978. Higher landings in Tamil Nadu to the tune of about 12,000 t were mainly responsible for the improvement in the total catch. Kerala and Pondicherry also contributed to this increase. The landings during 1969 to 1979 showed wide fluctuations (Table 4 and Fig. 8). While the maximum catch of 1,12,117 t was recorded during 1975, the minimum of 44,629 t was recorded in 1972. The catch recorded during 1979 formed about 61% of the maximum catch observed in 1975.

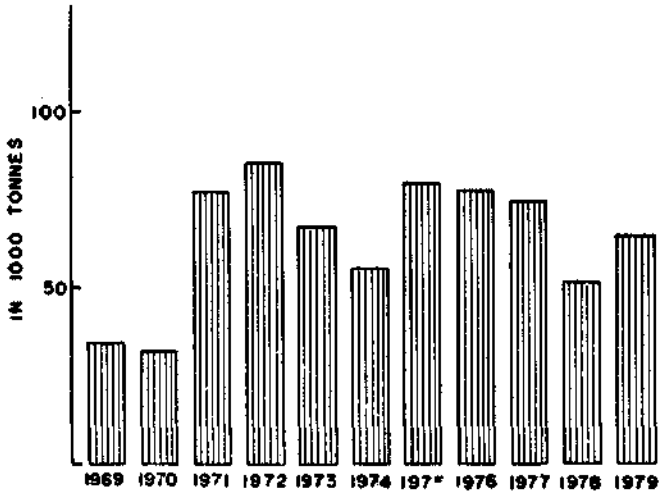


Fig. 9. Landings of non-penaeid prawns during 1969 to 1979.

Non-penaeid prawns

An increase of about 13,000 t in the landings of non-penaeid prawns was noticed during 1979 as compared to 1978. Maharashtra contributed to this increase by about 12,000 t. The landings during 1969 to 1979 showed year to year fluctuations (Table 4 and Fig. 9). While a maximum catch of 85,488 t was recorded in 1972, a minimum catch of 31,834 t was observed in 1970. The landings in 1979 formed about 75% of the maximum catch recorded in 1972.

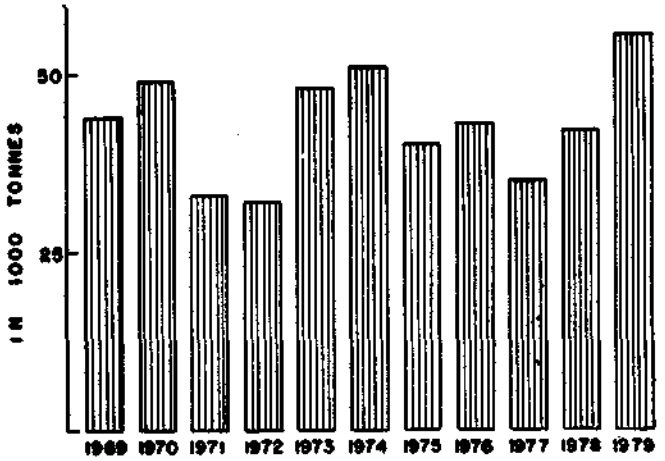


Fig. 10. Landings of silver bellies during 1969 to 1979.

Silver bellies

The landings of silver bellies (*Leiognathus* and *Gazza*) showed an increase of about 14,000 t over that of 1978. This was brought about by a substantial increase in the landings in Tamil Nadu by about 12,700 t. Table 4 and Fig. 10 show the landings during 1969 to 1979 showing wide fluctuations in the trend. The minimum of 32,392 t was recorded in 1972 and the maximum of 55,463 t was obtained during the current year.

Fishing harbour in Goa

A fishing harbour similar to Cochin fishing harbour is proposed to be developed at Caranzalam in Panaji, capital of Goa, near the mouth of river Mandovi. The harbour when completed at an estimated cost of Rs. 250 million would provide berthing facilities to over 100 mechanised fishing boats.

Model for successful fishery management

Oceanographers of NOAA's Northwest and Alaska Fisheries Centre in Seattle are developing mathematical models that may revolutionise the way in which fishery scientists gather and interpret the data needed for the management of fisheries. They call them dynamic ecosystem models, as opposed to the single species models upon which most fishery management systems have been based. While the single species model isolates the target species of a fishery from its surroundings in an attempt to simplify the condition under which the effects of fishing on that particular species may be studied, in the dynamic ecosystem model the entire ecosystem of a particular region, the interrelated mass of living organisms occupying the region and the substrate is taken into consideration. Estimates of abundance of selected species derived from the dynamic ecosystem models have given ±30 per cent accuracies, whereas the single species models gave no better than ± 50 per cent. Improved results are expected as measured data relative to ecosystem dynamics, based on proper monitoring, become available.

FNI 19 (4): April 1980

Wireless recorder to assist seine netting

Redifon Telecommunications in U.K. has developed a wireless recorder for use in a variety of seine netting applications. By this the ultrasonic data on net and catch can be recorded without the need for a cable to link net and transducer to the vessel. Data is transmitted from the net transducer to a towed receiver by radio techniques. The net transducer employs a pulse modulation technique which ensures low power consumption and long battery life. It operates at 200 kHz, has a maximum range of 2000 m and can function effectively at 1200 m depth. It weighs 18.8 kg on dry land including 8 dry cells providing 12 – volt supply.

The recording system uses a 150 mm paper display which gives a continuous paper record. A simultaneous record of the echoes from the water layers above and below the head rope, together with the water temperature is made. A five-step recording range (7.5 m to 120 m) enables the equipment to be easily adjusted to the setting suited to the conditions of the fising grounds and the skipper's fishing method.

FNI 19 (4): April 1980

Symposium on 'liquid fish'

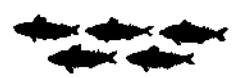
A one-day symposium on fish protein hydrolysates was held in Torry Research Station in Aberdeen. These are one of several products which can be produced from fish waste or fish which is normally only converted to fish meal. They are essentially liquefied fish protein preparations obtained by digesting fish flesh with proteolytic enzymes under controlled conditions and which are subsequently separated from bones and dried. These fish protein powders have solubility and dispersibility properties superior to those of fish meal. Their high protein (over 90 per cent) and low ash content makes them well suited as protein supplements for fish and animal feeds. Among other things the meeting concentrated on the potential of hydrolysates as milk protein substitutes in milk replacers for young animals.

FNI 19 (4): April 1980

Mackerel diet recommended to protect heart

According to German doctors a mackerel diet could help in the fight against heart disease. The Eskimos, like the Japanese, have a low incidence of heart disease. An acid which is present in high concentration in certain salt water fish might explain this low incidence of heart disease in Eskimos by reducing the tendency of clotting in their blood. Based on this theory six German doctors conducted some experiments by changing the diet of Europeans to that taken by the Eskimos. They chose mackerel which has a high content of this acid.

The doctors subjected seven Europeans to a diet consisting almost exclusively of mackerel in stewed and smoked forms for one week. There were biochemical changes in their blood, giving confirmation to the theory. These results represent an exciting development in the potential for dietary prevention of thrombosis in humans. Further studies with fish diets over longer periods are in progress. FNI 19 (4): April 1980



IN MEMORIAM

G. K. KURIYAN

G. K. Kuriyan, Director of the Central Institute of Fisheries Technology, Cochin passed away on August 5, 1980 following a stroke at New Delhi while on official tour.

Kuriyan was born in 1923 in Alleppey, Kerala and educated at Madras Christian College where he received his B.Sc. degree and at St. Johns College, Agra where he took his postgraduate degree in Zoology in 1945. He served with the Department of Fisheries of Madras State initially as Research Assistant and later as Assistant Director till 1957, when he joined the Central Institute of Fisheries Technology at its inception.

After serving the Institute in various assignments such as Assistant Director (Gear) from 1957 to 1962, Senior Research Officer (Craft and Gear) from 1962 to 1971 and Head of Division (Craft and Gear) from 1971 to 1974 he was appointed as the Director of the Institute on September 3, 1974. During this period he had advanced training in fishing gear and methods at Tokai Regional Fisheries Laboratory, Tokyo, Japan in 1964 and also worked with several international gear and craft experts. His career in these positions marked an outstanding chapter in the growth and development of fishing craft and gear technology of the country. His pioneering efforts have resulted in the development of new designs of fishing crafts of various sizes suited to our waters and new concepts of fishing gear, which are now known as standard CIFT designs.

Kuriyan was recognised as the leading scientist in the field of fishing craft and gear technology and has published over 75 research papers in addition to guiding several others. He was connected with several professional and academic bodies. As the founder Secretary and later President, Society of Fisheries Technologists (India) he ably guided the activities of the Society. The various professional Committees and Advisory Boards he worked on are too numerous to mention. He was Chairman, Sectional Committees for textile materials for fishing purposes and for fishing boats and Fellow of the Indian Standards Institution (ISI). He actively participated in several symposia and seminars, both national and international and in July 1976 chaired the technical session on Shell Fish at the International Conference on Handling, Processing and Marketing of Tropical Fish at the Tropical Products Institute, London.

Apart from his impressive accomplishments and contributions, what set Kuriyan apart from others was his humorous nature and his interest in music especially the devotional type. His numerous friends will miss him.

M. J. GEORGE

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